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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,527	04/15/2004	Alfred M. Halling	03-IMP-031	8158
29393	7590	07/26/2005	EXAMINER	
ESCHWEILER & ASSOCIATES, LLC NATIONAL CITY BANK BUILDING 629 EUCLID AVE., SUITE 1210 CLEVELAND, OH 44114			BERMAN, JACK I	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/825,527		HALLING ET AL	
	Examiner		Art Unit	
	Jack I. Berman		2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/15/04</u> . | 6) <input type="checkbox"/> Other: ____. |

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The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: An embodiment of the angle adjuster claimed in claim 16 wherein the first bending element is comprised of a pair of permanent magnets across which a magnetic field is generated and the second bending element is comprised of a pair of plates across which an electric field is generated should be described.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the embodiment of the angle adjuster claimed in claim 16 wherein the first bending element is comprised of a pair of permanent magnets across which a magnetic field is generated and the second bending element is comprised of a pair of plates across which an electric field is generated must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet”

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12, 13, 15, 17-19, and 21-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Glavish. Glavish discloses an angle adjuster for a batch ion implantation system comprising: an ion source (32) that generates an ion beam; a first bending element (scanner 2) comprised of a pair of plates across which a magnetic field is generated that receives the ion beam and alters the path of the ion beam by a first offset angle in a first direction; a second bending element (compensator 4) that receives the ion beam from the first bending element and alters the path of the ion beam by a second offset angle in a second direction, wherein the second direction is opposite the first direction; an angle adjuster controller (control computer 199) coupled to the first bending element and the second bending element that selects the first offset angle and the second offset angle according to a desired implant angle and a current target position; wherein the angle adjuster further generates control signals received by the first bending element and the second bending element in order to control their operation (see lines 42-62); a focusing element (post accelerator (48), post-accelerator analyzing magnet (56), and/or sextupole magnet (150) as explained from line 52 in column 13 through line 34 in column 15)

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that receives the ion beam, focuses the ion beam, and directs the ion beam towards the first bending element; and wherein the first bending element is further operable to selectively focus the ion beam (see lines 15-40 in column 22). The Glavish system is operative to perform a method of performing ion implantation comprising: generating an ion beam comprising a selected species; selectively removing undesired materials from the generated ion beam (by means of the analyzer magnet (40)); accelerating the ion beam to a selected energy level (by means of post-accelerator (48)); and altering a path of the ion beam according to a desired implant angle and a current target position to implant the selected species at the target position and the desired implant angle by deflecting the ion beam by a first offset angle in a first direction, and then deflecting the ion beam by a second offset angle in a second direction, wherein the second direction is opposite the first direction and altering the path of the ion beam further comprises selectively focusing the ion beam before deflecting the ion beam by the first offset angle, selectively focusing the ion beam before deflecting the ion beam by the second offset angle, and selectively focusing the ion beam after deflecting the ion beam by the second offset angle (see line 9 in column 21 through line 48 in column 22).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any

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evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5 and 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glavish in view of Turner and Viviani. Glavish discloses a batch ion implantation system comprising: an ion source (32) that controllably generates an ion beam containing a selected species; a beamline assembly that comprises a mass analyzer (40) that selectively removes undesired particles from the ion beam and a linear accelerator (48) that selectively accelerates particles within the ion beam to a selected energy level and that processes the ion beam from the ion source; an angle adjuster that selectively alters a path of the ion beam according to a current target position and a selected implant angle (see line 42 in column 27 through line 47 in column 28) wherein the angle adjuster comprises a first bending element (scanner 2) and a second bending element (compensator 4) that generate magnetic fields across the path of the ion beam, wherein the first bending element alters the path of the ion beam by a first offset angle in a first direction and the second bending element alters the path of the ion beam from the first bending element by a second offset angle in a second direction, wherein the second direction is opposite the first direction; and an end station comprising a spinning disk (carousel 26) that rotates about an axis. The angle adjuster is controlled by an angle element controller (control computer 199) that applies control signals to the first and second bending elements that alter the path of the ion beam by an offset angle and controls the angle adjuster in accordance with the target position (see line 9 in column 20 through line 8 in column 21), so there must inherently be some

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unspecified means for obtaining the current target position because the Glavish system could not function without this information, and also in accordance with defined limits on the applied dose (see lines 49-57 in column 22), which is inherently a function of wafer rotation. Glavish does not teach to move the spinning disk in a linear direction or to affix pads to the outer edges of the disk to hold target wafers at an offset angle, however, Turner teaches to translate a spinning disk that holds target wafers at offset angles by means of pads (i.e. stops, as is described at lines 23-27 in column 3) so as to move the wafers through an ion beam in order to implant ions in them and further teaches to tilt the spinning disk in order to control the angle of ion implantation. Viviani teaches at lines 41-56 in column 2 that ion beam angle adjusters, such as that described by Glavish, are functionally equivalent to workpiece tilting mechanisms, such as that disclosed by Turner. The use of Glavish's ion beam angle adjuster in the Turner ion implantation system having a translating spinning disk instead of the workpiece tilting mechanism disclosed by Turner would have been an obvious substitution of known equivalents.

Claims 12, 14, 15, and 19-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Enge. Enge discloses an angle adjuster for a batch ion implantation system comprising: an ion source (10) that generates an ion beam (20), a mass analyzer (11) that selectively removes undesired materials from the generated ion beam, a first bending element (magnet 32) that receives the ion beam and alters the path of the ion beam by a first offset angle in a first direction; a second bending element (sector magnets 23, 24) that receives the ion beam from the first bending element and alters the path of the ion beam by a second offset angle in a second direction, wherein the second direction is opposite the first direction; and an angle adjuster controller (not illustrated, but inherent since the deflections of the two elements must be

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coordinated in order for the ion beam to arrive at the target at the required location and angle of incidence) coupled to the first bending element and the second bending element that selects the first offset angle and the second offset angle according to a desired implant angle and a current target position. At lines 23-36 in column 3, Enge teaches that bending elements incorporating pairs of plates across which an electric field is generated can be combined with the magnetic bending elements of the preferred embodiment. At lines 27-57 in column 5, Enge teaches that the bending elements have optical properties that can be adjusted to selectively focus the beam.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Enge. At lines 27-30 in column 3, Enge teaches that an ion beam angle adjuster may comprise a magnetic bending element followed by an electrostatic bending element, i.e. a pair of plates across which an electric field is generated. While Enge does not teach to use a pair of permanent magnets as the magnetic bending element, permanent magnets are known to be functionally equivalent to electromagnets for the purpose of bending beams of charged particles so the use of such permanent magnets instead of the electromagnets discussed by Enge would have been a substitution of known equivalents.

Claims 1, 4-7, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enge in view of Robertson. At lines 4-15 in column 3 and lines 41-45 in column 5, Enge discusses Robertson and suggests a hybrid system comprising the double deflection system disclosed by Enge and the spinning and linearly translating system that adjusts the movement of the end station in the linear direction to keep an applied dose within acceptable limits. It would have been obvious to a person having ordinary skill in the art to follow through on this

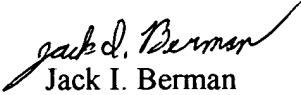
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suggestion and construct the hybrid device in order to make use of the advantages described in the two patents.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack I. Berman whose telephone number is (571) 272-2468. The examiner can normally be reached on M-F (8:30-6:00) with every second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jack I. Berman
Primary Examiner
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jb
7/24/05